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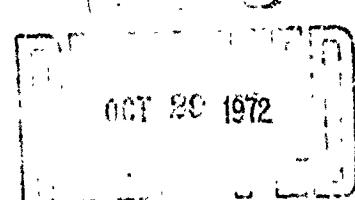
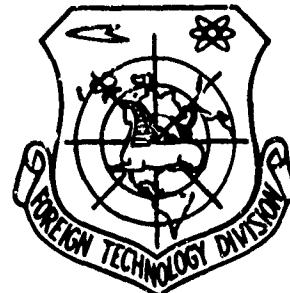
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SOME REFLECTIONS ON THE TACTICS OF
FIGHTER-BOMBER AVIATION UNDER THE
CONDITIONS OF ENEMY AIR SUPERIORITY

by

L. Dobrecevic



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SOME REFLECTIONS ON THE TACTICS OF FIGHTER-BOMBER AVIATION UNDER THE
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On the assumption that an attacker may have operational superiority in the air throughout the entire conduct of the war, which is quite possible, the action of a small air force would be governed by the following conditions:

- a. vigorous action of all types of enemy aircraft and some missiles by day and by night and under favorable and complex weather conditions, and particularly vigorous action of enemy reconnaissance aircraft, unattached fighters, fighter-bombers, and a portion of the bombers,
- b. the system of airfields would not have an artificial screen, and because of the small depth of the territory of small countries, it would be exposed to constant air attacks and destruction by enemy offensive weapons,
- c. the Air Force Observation, Information, and Reporting system would have great operating difficulties because of the enemy efforts to neutralize or destroy it through continual actions,
- d. fighter-bomber aviation would have limited opportunities to carry out varied and numerous missions under specific conditions, at night and when weather conditions are complex.

All of this could have an adverse effect on the possibilities for use and action of the defender's aviation and would call for maximum efforts on the part of all personnel and rational utilization of the available equipment. This article will therefore examine certain of the problems and present an opinion on the organization, preparation, and conduct of fighter-bomber combat actions when the enemy has air superiority.

Organization and Preparation of Combat Actions

Particular attention will have to be paid to the organization and preparation of combat actions since timely and successful performance of tasks will depend greatly on this. In the discussion below we shall examine certain problems in this area.

The tasks of fighter-bomber aviation will depend on need and its capabilities; on the principle of economy of forces, one must take into account the purposiveness, feasibility, and pay-off of missions, and this is particularly true when the enemy has air superiority.

The strength of groups for conducting individual missions will depend on a number of circumstances. First of all, the strength of the group will depend on the mission itself, on the desired goal, on the type of warheads used, on the distance to the target: that is, on requirements that have to do with tactical operations. But the composition and strength of the group will also be influenced by the following when the enemy has superiority:

- a. the possibility of take off of single aircraft or sizeable groups because enemy air attack will be continually closing runways,
- b. acting in time because the aircraft will be kept a long way from the runway, and this means that it will take longer for sizeable groups of aircraft to take off and get into formation,
- c. it will be difficult or even impossible for a sizeable group of aircraft to take off simultaneously from a single airfield because of the frequency of overflights by unattached enemy fighters and fighter-bombers, reconnaissance planes, and other aircraft above and in the area of the airfields.

It will be difficult for sizeable groups of aircraft to take off simultaneously from a single airfield, and it will be almost impossible to achieve surprise for purposes of a surprise attack by a sizeable group.

Then again, because there will be a constant danger of enemy attack on the aircraft during flight from the airfield to the target and because it is difficult for sizeable groups to fly low and to remain for a long time over the target during the attack maneuver, special forces are needed to provide security from take off to landing, and at times special forces will be needed to neutralize antiaircraft guns in the target area.

All of this leads to the conclusion that small groups of 4, 8, or 12 aircraft (from a flight to a squadron) are most suitable when the enemy has superiority.

To some extent the size of the group is already determined by the type of mission. However, this does not mean that a large number of objectives will be attacked because the groups are small. Forces can be concentrated on a fixed number of targets, and this will be done when necessary: small groups will take off from several airfields and engage in simultaneous attacks of selected targets. It will also be possible for these groups to carry out staged attacks against a fixed number of targets. The advantage of the small groups rely on the possibility of achieving surprise and avoiding enemy counteraction.

The choice of time and the type of action will be affected by many factors that will have particularly to do with whether fighter-bomber aviation can operate according to plan, i.e., at a time fixed in advance, and also to operate on call.

Planned action to support ground force units, which normally and in principle are planned according to the combat and combat actions of ground force units, which is when there will be the greatest number of suitable targets for the most effective action of aviation, will depend on take off possibilities. In those situations we can also expect intensified enemy activity against airfields in order to prevent take off, which jeopardizes possibility of carrying out planned action.

As for on-call action, whose timeliness is governed by many factors having to do with the organization and method of command, the number of take offs envisaged, etc., although it depends on enemy action, it appears that it will be possible to achieve it more frequently at a specified time than planned action. These actions may be sudden and unexpected, and therefore they will be easier to accomplish even when the enemy has superiority.

In any case we should bear in mind that the effect of enemy air attacks on airfields and the possibility of repairing the damage from these attacks will affect the possibility of take off and therefore the time of possible action.

As to the choice of time for an action when the enemy has superiority, we can apparently expect that several commands will at times be able to fix and plan a precise time for an action and that great initiative and resourcefulness will be required of the officers of lower units (group, squadron).

In connection with the above and also in view of the possibility for achieving surprise, in choosing the most favorable time for combat action of fighter-bomber aviation when the enemy has superiority preference should be given to the following:

- a. nighttime, particularly when it is bright and not so dark,

- b. dawn and twilight,
- c. in the daytime when weather conditions are poor in the area of the airfield and along part of the flight course, but somewhat more favorable in the area of the objective,
- d. when the activity of enemy fighter aviation, solitary fighters, and other types of aviation is light,
- e. immediately after enemy attack on an airfield if take off is still possible after the attack, even though the bomb-loads must be reduced.

In all cases when the time of an action is being fixed and chosen, it is very important to know the situation in the air and on the ground, particularly the air situation in the areas of airfields used by one's own aviation and in the areas where missions are to be carried out.

The Conduct of Combat Action

For the sake of completeness, in discussing the concept of combat action when the enemy has superiority, we will briefly examine all procedures from rolling out the aircraft for take off, the flight to the target, the attack, the return, and finally preparation for subsequent action, insofar as they differ from the conditions when the enemy does not have superiority.

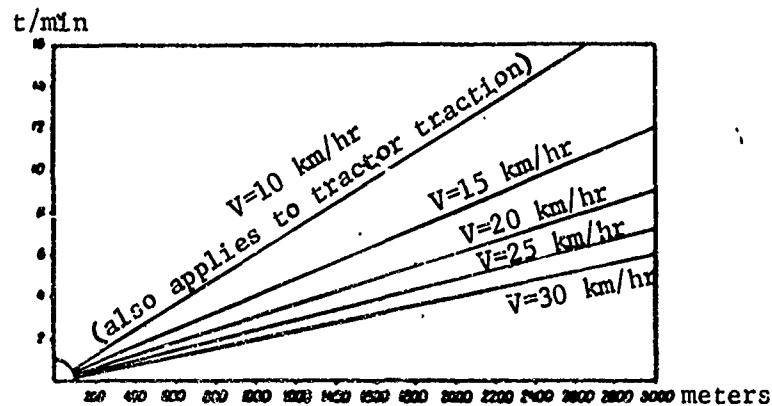
Bringing the Aircraft to the Runway. Getting the aircraft to the runway is a problem when the enemy has superiority, particularly when the use of nuclear weapons is assumed, since the aircraft must be scattered as much as possible: both in the sense of deployment of the aircraft at each airfield and in the sense of basing a smaller number of aircraft at each airfield. Individual aircraft or groups of aircraft may be stationed 2-3 kilometers or further from the runway, which means a trip of 5-15 minutes to the runway, depending on the type of traction (taxiing under their own power or drawn by tractors). (Graph 1)

Under their own power aircraft usually taxi at about 30 kilometers per hour, and when tractor-drawn, they move about 10 kilometers per hour. The type of traction used to bring aircraft to the runway will depend on the speed required for reaching the runway, which depends on the danger of enemy activity and on whether the operation is performed at night or in the daytime. The lower the speed, the longer it takes to reach the runway, and vice versa. For example, if the total distance from the fortified hangar to the runway is 2,700 meters (including the branch-off from the main route to the hangar), we can see from the graph that:

- a. it takes 1.3 minutes (1 minute 18 seconds) to travel the 2,000 meters of the branch-off from the hangar to the main taxiway at a speed of 10 kilometers per hour,

b. it takes 5 minutes to cover the 2,500 meters of the main taxiway at a speed of 30 kilometers per hour.

The total time to reach the runway will be 6 minutes 18 seconds.



Graph 1. Graph indicating distance from the runway and travel speed to the runway.

If taxiing speed is 20 kilometers per hour and the distance the same, then the time will be $1.3 + 7.5 = 8$ minutes 48 seconds.

This long time used in traveling from the fortified hangar to the runway represents a great hazard of air attack by solitary enemy fighters or fighter-bombers on the aircraft moving along the open taxiway. When the enemy has superiority, therefore, particularly in the daytime, one should use the fastest means of reaching the runway even though it means greater consumption of fuel; tractors can be used to pull the aircraft at night or at dawn. In addition, the travel time between the hangar and the runway should be reduced in the following ways:

a. fortified hangars at the head of the runway should be used for aircraft assigned to action in the antiaircraft defense system,

b. support aircraft should be kept in stage 2 of readiness when participating in planned action and in stage 1 of readiness when acting on call,

c. the trip to the runway should be made simultaneously from different groups of fortified hangars, so that no more than four aircraft are making the trip from the individual groups.

Take off should be in order of arrival of the aircraft at the head of the runway; frequently the runway should be used in both directions, and the aircraft should take off from that end of the runway which is

closest to the group of hangars. It would be very risky to wait at the head of the runway for all the aircraft to assemble for take off, and it is better for the aircraft to take off without waiting even though the first to take off will consume more fuel, since security will be greater, and this increases the possibility of carrying out the mission better.

Apparently overtaking or circling will be the principal way in which small groups of four aircraft will group. The former is more suitable since the aircraft taking off first can fly at minimum permissible speed for that type of aircraft (in straight flight, without banking, turns, etc.), and, most important, since they are moving away from the runway, the aircraft go into formation further from the airfield, which helps to avoid attack from solitary enemy fighters which might appear over the airfield in this phase. The weak point is that the group will be in loose formation for a long time, the first aircraft will be flying at low speed and will not be able to maneuver in case of enemy attack, and the aircraft will group on the periphery or outside the range of anti-aircraft guns. The weak point of the latter method is that a group which has just taken off and is grouping while circling may be attacked by solitary enemy fighters over the airfield, and that the group is left open while getting into formation, since this method of grouping takes place at a somewhat higher altitude than in the first case. Preference should therefore be given to grouping by overtaking.

Protection of Fighter-Bomber Groups During Conduct of Combat Missions. It must be expected that enemy antiaircraft defense, particularly fighters and antiaircraft artillery, will offer resistance when combat actions are being carried out, and this means that one's own fighter-bomber groups must be protected.

One can expect that enemy fighters (day and night) will be located in a zone about 80 to 150 kilometers behind the front lines. They will most likely carry out their mission from a state of readiness on the ground but when their ground forces are carrying out certain important actions, they will also operate from air readiness (from waiting and patrolling zones).

According to some views, the strength of counteracting fighter groups will range from a minimum of 12 to a maximum of 36 aircraft.

In addition one must also count on enemy fighters covering the action of their bombers and fighter-bombers and also on wandering fighters which might appear during the flight to carry out the mission.

This possible counteraction of enemy fighters leads us to the conclusion that various tactical measures will have to be used, in particular:

a. actions will be carried out by small fighter-bomber groups (4-8 aircraft) taking advantage of the masks of enemy radar, the sun, clouds, etc., which can be done without the fighter protection,

b. the actions of stronger groups in the daytime (12-15 or more aircraft) will be given fighter protection on the trip out, in the target area, and on the trip back. Depending on the situation it will be possible to combine protection by actual escort, possible repulsion of enemy patrols, and protection in the target area,

c. at night and in bad weather small groups will operate without fighter protection.

In the less active portions of the front, where the activity of enemy fighters is lighter, stronger fighter-bomber groups can operate without protection.

Enemy Antiaircraft Artillery. As for antiaircraft artillery, one can expect the action of about 1/4 medium and 3/4 light antiaircraft artillery on the battlefield and around the objective which it is defending. If we add to this the fact that the number of antiaircraft guns has been increased in all ground force units, so that there is an average of 20-25 antiaircraft guns per kilometer of front along the main line of march, we can conclude that certain areas will be so well defended that air force actions in these areas must be avoided. As for antiaircraft missiles, we must expect that they will be used to defend objectives fairly deep in enemy territory.

It therefore follows:

a. that objectives strongly defended with antiaircraft artillery should in principle be avoided, and if the attack must be carried out, then one should try to carry it out at dawn or twilight, and also at night, when antiaircraft artillery is less effective. It is also more suitable and necessary to carry out attacks with small groups approaching from several directions and at low altitude, without neutralizing antiaircraft artillery,

b. when a daytime attack is made on objectives weakly defended with antiaircraft artillery, various methods of neutralization can be used with aircraft specially assigned to that task; one of the groups can attack antiaircraft artillery in the first pass and in the next pass attack the objective, the fighter protection, or the ground-force artillery if the antiaircraft artillery at the objective being attacked is within its range,

c. in any case it is worthwhile to use antiaircraft maneuvers during the attack, changing direction, speed, and altitude,

d. at times it will be possible to use tricks at the approaches to the objective: for example, 2-4 aircraft may fly at a higher altitude and draw attention, while the main group will come in low and attack the objective.

Maneuvers Over Objectives. In order to diminish the effectiveness of enemy antiaircraft defense, when the enemy has superiority it becomes even more important to carry out rapid and precise maneuvers over the objective. The maneuver should guarantee maximum success of the mission at minimum losses and should be based on well-known principles, such as simplicity, purposiveness, security, timeliness, variety, etc., which applies equally to a group of aircraft as well as to an individual aircraft, except that the time over the target depends on the size of the group. The tactical conditions of the maneuver are of decisive importance, and they have mainly to do with the nature of the objective (its position and distance, its unit size, its area, its resistance, and its mobility).

Given the constant danger of counteraction by enemy antiaircraft defense, one must strive to keep the maneuver time over the target to a minimum, which means:

- a. only one pass during the attack,
- b. the attack is carried out by small groups as possible;
- c. stronger groups will attack simultaneously from several directions in order to disorient enemy antiaircraft defense,
- d. strongly defended objectives will be attacked from very low altitude and from several directions at once when this is possible,
- e. shallow formations are chosen for the attack, since short formations spend less time over the target,
- f. suitable and obvious landmarks (KOS and TU *[Expansion unknown]*) should be chosen so as to save time,
- g. finally, crews should be drilled in carrying out maneuvers (physical conditions), etc.

One should also take into account the other conditions pertaining to maneuvers (the slope of the land with respect to the target, the wind conditions, natural and man-made obstacles around the target), all of which may have a favorable or adverse effect on the speed and accuracy of action during the attack maneuver.

Regrouping After the Attack and the Return Flight. When the enemy has superiority, it becomes even more important for the group to leave the target quickly after the attack has been made, since enemy fighters will usually take up pursuit, and the action of enemy antiaircraft artillery in the area of the target will make it necessary to quickly get out of its range.

Accordingly, maximum security requires the following:

- a. aircraft will leave the target at very low altitude, taking advantage of the configuration of the land, the sun, cloudiness, etc.,
- b. they will regroup over their own territory at low altitude, behind hills or mountains (in the shadow of enemy radars) and near obvious landmarks. If there is fighter protection, its presence should be used to cover the regrouping,
- c. the return flight should be made at low altitude, and various return routes should be used. If there is fighter protection or if the activity of enemy aviation is light, the entire group may use a single return route. In any case, one should use the configuration of the land, clouds, the sun, and the like, in order to conceal the flight.

Landing and the Return Trip to the Fortified Hangars. Landing must be as fast as possible because roaming enemy fighters or fighter-bombers may counteract in the area of the airfield. At times this will have to be done under the cover of one's own fighters or some of the fighter-bomber forces, and cover must always be provided by the antiaircraft defense at the airfield. If the enemy is attacking the field as the aircraft approaches for landing, then the group about to land must attack the enemy aircraft, or, if it cannot do this, it must withdraw and wait for a break in a suitable zone.

If it cannot wait for a break in the attack because of low fuel supply, it must land at auxiliary or nearby airfields, and in extreme need it will make a forced landing near the airfield. In this case the group must obtain special permission, which can be arranged in advance.

If normal landing at the home airfield is possible, the main thing is for the aircraft that have landed to be quickly taken to the hangars. The return trip to the hangars can be faster than the trip to the runway because the aircraft are now empty, they can travel faster (up to 50 kilometers per hour), there is no need to save fuel, and they should taxi under their own power.

Preparation for Subsequent Action. This question deserves particular attention because of the changes that have taken place in other prodigious areas. First of all, preparation of the aircraft and the crew for subsequent action will depend on the activity of enemy aviation in the area of the airfield, and second, the scattered deployment of the personnel and materiel at the airfield will have an influence on preparation. We shall therefore stress only some of the general questions pertaining to the preparation of aircraft and crews for subsequent action, as follows:

a. the aircraft should be fueled by driving the tank truck to the hangar, and bombs should be hung on the rack, the postlanding inspection, and other procedures should be carried out right in the hangar, to guarantee maximum security,

b. groups to service aircraft should be formed so that every group of hangars has its own work group,

c. to save time the flight crews should be briefed, mainly as to the situation at the moment and the tactics of the enemy air force, while the aircraft are being readied.

By way of conclusion we should emphasize that many of our officers are aware of all this, but we still wish to encourage discussion and reflection on the problems of organizing, preparing, and carrying out combat actions of fighter-bombers when the enemy has air superiority.